INTRODUCTION: RULING ‘CLIMATES’ IN THE EARLY MODERN WORLD

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How did people in the early modern world conceive of, and attempt to leverage, the relationship between themselves and their environments? The essays collected here shed light on this fundamental question through an interdisciplinary approach that takes into account both concrete environmental practices and the medical, philosophical, and political conceptions that sustained them. In so doing, this volume collectively pursues three main objectives: first, to bring together the all-too-often separate fields of intellectual history and environmental history in order to examine how early modern environmental governance functioned both in ‘theory’ and in ‘practice’; second, to further our knowledge of early modern environmental practices and their social and political implications; and third, to demonstrate that early modern understandings of the environment were much more complex, contested, and ideologically invested than historians have hitherto given them credit for.

The relationship between environmental conditions and social and cultural formations in the early modern period has been the object of a number of recent studies. Historians have placed nature as a ‘historical protagonist’ at the centre of their narratives, demonstrating the relationships between a variety of phenomena from climatic change to global wind systems and the fates of states and empires.[1] In these studies, the environmental is analysed as an influence on the political. The essays in this volume similarly attend to the relationship between environmental conditions and political formations. Where they differ from this earlier work is that rather than analysing the historical link between environment and government, they examine how both single individuals and larger collectivities conceptualised this link and exploited it towards specific goals. In so doing, *Governing the Environment in the Early Modern World* seeks to reassess the relationship between environments and societies from the agents’ own perspective, that is, by taking into account how early modern people themselves made sense of their relationship with their living milieus.[2]

Such an approach—pioneered in important works such as William Cronon’s *Changes in the Land* (1983) and Richard Grove’s *Green Imperialism* (1995)—is useful for various reasons, not least because it can help avoid projecting our own modern categories onto the environmental conduct of past societies.[3] In this respect, the project of an environmental history written from the agents’ perspective does present some challenges. First of all, the interventions into the physical world that we might term ‘environmental’ today were not necessarily considered to be such in the early modern period: it is not sufficient to consider forestry ordinances or river regulation as ‘environmental’ simply because they deal with aspects of what we consider ‘the environment’ today. Not all ‘environmental regulation’ was undertaken with specific environmental goals in mind. For example, in early modern Germany, village bylaws restricting access to various natural resources did not reflect an ecological or sustainable sensibility in their authors (the very terms ‘ecology’ and ‘sustainability’ being, of course, of a rather more recent

coinage).[4] Rather, they were to guarantee harmony amongst neighbours co-habiting within fixed biological limits; their function was overridingly social, rather than ecological in a modern sense.[5] Actions such as these are environmental only insofar as, to put it with one environmental historian, all our actions are environmental.[6] As historians we might then study the environmental consequences of, say, state forestry policy, but we would be wrong to see such policies as being particularly preoccupied with an 'environment' that is rooted in modern conceptions of ecology.

It is then crucial to understand what, exactly, was the environment over which early modern societies sought to govern—if one existed at all. The essays presented here engage with this core question in various ways. What emerges overall is that among early modern Europeans there was no single notion of 'the environment' as we conceptualise it today. While the term itself made its first appearance in European vernacular languages as early as the thirteenth century,[7] it was long before it came to be used in the sense that we most frequently attach to it today—namely that of 'a set of interdependencies between Earth, animals, plants, climate and humans' that can be studied on either a local or a global scale. In Philemon Holland's 1603 translation of Plutarch's *Moralia*, the term is used alongside the English neologism 'circumplexion' (an encompassing of one thing by another) to translate the Greek *perieleusis* within a discussion of magnetic attraction that bears little connection to modern 'environments'.[8]

It is true that, at various times before the modern age, other terms were occasionally employed to refer to the ensemble of physical factors—primarily, though not exclusively, natural—that formed the context for all human activity on earth. In his *Tetrabiblos*, written in the second century BC, the Greco-Egyptian geographer and astrologer Claudius Ptolemy spoke of the climatic conditions of a given region in terms of *ta tou periechontos katastēmata* (literally, 'the conditions of what is all around').[9] But if Ptolemy's notion of *periechon* ('what is all around') may seem to come close to the modern meaning of 'environment', it did not quite cover the whole spectrum of physical factors that we now recognise as part of 'the environment'. Ptolemy was primarily interested in temperature and humidity, in keeping with Greek physics and meteorology which were based on interactions between four fundamental elements or qualities: hot, cold, moistness, and dryness. He was also interested in astral influences, which he saw as the 'general causes' producing climatic diversity on earth as well as affecting human character and behaviour.[10] He was far less interested in examining the role that landscape features such as mountains or hills, soil quality, and the presence of running or standing waters played in shaping the climatic profile of a given place and its effects on local residents—although he did recognise at one point that 'even within the regions that in general are reckoned as hot, cold, or temperate, certain localities and countries have special peculiarities of excess or deficiency by reason of their situation, height, lowness, or adjacency'.[11]

Ptolemy's astro-meteorological ethnology, which featured a rough division of the inhabited world into four quarters dominated by different combinations of elemental qualities and astral influences (including those of the sun and the moon), would long remain an authoritative model for conceptualising environmental conditions and their effects on humans.[12] It was not, however, the only model available. In antiquity as in the early modern period, a range of different concepts were mobilised to describe the essential physical characteristics of a defined place, also with respect to their effects on local human populations. While a strand of early modern geographical

thought looked back to classical theories of *klima* (literally 'slope' or 'inclination') to develop a tripartite view of the world as comprised of a hot zone, a cold zone, and a temperate zone in between,[13] other traditions similarly arising from classical antiquity worked in concert, and occasionally interfered, with this latitude-based outlook. For instance, the Hippocratic vocabulary of 'airs, waters, and places', which permeates early modern descriptions of urban and rural areas, draws attention to both meteorological factors (such as wind and rainfall) and specific landscape features (such as marshes, rivers, and mountains) as crucial components of what we would now call the 'climate' of a place and its overall ecological profile.[14]

Latitude, weather, air quality, and landscape features were thus seen as distinct, and not always necessarily interrelated, aspects of the physical milieus that human beings inhabited. Today we tend to bundle these concepts together and dub the result 'the environment'—a term that itself lacks a precise definition and is often imbued with shifting meanings depending on how and where it is used.[15] Early modern Europeans lacked such a unified concept of 'the environment'; their understandings of the physical world around them were irreducibly plural and varied greatly depending on the scale of the analysis and the explanatory model adopted.

While it is important to acknowledge such semantic gaps between modern and early modern notions of 'the environment', the term, we believe, can still be fruitfully applied to the study of early modern ideas and practices provided that we exercise some caution in utilising it. Throughout this collection, we propose to use the term 'environment' broadly to signify the spaces in which people lived and with which they engaged physically, intellectually, spiritually, and imaginatively. Following the insight of several recent commentators, we deem it especially important to understand the environment as the open-ended result of humanity's agency (be it creative or destructive, conscious or unconscious) rather than as a pre-existing given. Although we use the singular 'environment', it is important to recognise there is no single 'environment', instead there are many – always contextual and always historical. More particularly, we take 'the environment' to be the outcome of practices of 'environing' that produce environments in the plural, that is, spaces 'where humans live and where humans have entered into a self-conscious relationship with their surroundings.'[16] Encompassing both the cultural process whereby humans perceive and conceptualise environments in their imagination, and the physical process of 'place-making' whereby they concretely transform and reshape them, the concept of 'environing' allows us to think at once about the ways in which people have altered the world around them and about 'the symbolic transformations which configure "the environment" as a space for human action.'[17] There is an essential subjectivity in the shorthand 'the environment' that the chapters in this volume reveal in a variety of historical contexts.

The notion of environing is particularly useful when thinking about the relationship between environments and political interpretation and action. By attending to the ways in which people have historically produced their environments, we must retain a multiple focus. Environments should be understood in terms of their physical actuality, the intentions of their many creators, and the representations of those who encountered them. Environments are 'nature made social', sometimes even directed and shaped by understandings of the social and 'created as a solution to problems felt in societies.'[18] Because of this tight connection between environments and the societies that produce them, environmental discourse has often historically been bound up with the pursuit of particular social policies or political ideologies. The early modern period is no

exception, and the way in which environmental theories have from time to time been bent to serve ideological and political agendas is at the centre of several contributions in this collection, including those of Dodsworth, Morera, and Zilberstein which explore the issue over a broad chronological and geographical span. Other chapters in this volume address various aspects of early modern environings in relation to social and political practice, discussing attempts to control and manipulate the physical world, the motives behind these interventions, and how people interpreted the ways in which the physical might or might not manifest the political.

As products of a dynamic relationship between humans and nature, environments are to be understood as objects that are at once physical and cultural—at once given and constantly (re-)created. Environments, that is, are as much *inside* culture as *outside* of it, in that they constitute a precondition for all human experience as well as an ever-changing effect of it. In light of this fact, we believe that the joint study of environmental practices and ideas in context can provide a fresh approach to the environmental history of the early modern period.[19] The essays in this volume offers a few examples of how such an approach can be fruitfully applied to various geographical and historical contexts, including France, England, and the colonial Atlantic.

If environments can be interrogated as dynamic relationships between people and the world around them, the cultural constructions that sustain historical understandings of this relationship are then equally plausibly understood and interrogated as environmental. Whilst this volume deals with explicit attitudes and actions towards the environment, its aim is not to limit environmentally-informed analyses of early modern politics to explicit statements of environmental ideas more generally. Other histories remain to be written that uncover the unspoken, assumed and implicit environmental values on which aspects of early modern politics and statecraft rested.

Environmental influence, environmental governance, and climate change

Among the long-standing cultural constructions that early modern Europeans could draw upon to make sense of the relationship between themselves and their environments is a corpus of doctrines of ancient Greek origins, often known as ‘climate theories’ or ‘theories of climatic influence’.[20] Though common in scholarly usage, such terms should be employed with a certain caution when referring to a period when modern scientific climatology did not yet exist, the causes of climatic diversity and heat distribution on earth were not yet clarified, and the word ‘climate’ itself still largely retained the technical cosmographic meaning of the Greek term *klima* from which it derived, instead of being used in the modern meteorological sense.[21] ‘Climate theory’ is, in fact, a modern label, retrospectively imposed by scholars upon a diverse range of doctrines of environmental influence that were first advanced in classical Greece and then handed down to early modern Europe through a complex tradition.[22] Such doctrines ascribed a fundamental role to a number of environmental factors such as landscape, weather, and the stars in shaping the physical, mental, and moral constitution of human beings. From Hippocrates to Montesquieu, theorists working in this tradition construed such factors as major determinants of both individual and collective identity: it was primarily because of their different milieus— these theorists argued—that northern nations were rash, gluttonous, and skilled for all sorts of handicrafts, while people from hot places were prudent, vengeful, and adept to the speculative

sciences.[23] Knowing the environmental components of 'national character' was thus of the utmost importance for understanding why certain peoples behaved in certain ways, how they should be governed (or how they could be conquered), and what was required to reform their character and conduct. As Jean Bodin argued in his 1576 *République*, effective statecraft implies 'accommodating' laws, policies, and political regimes to the environmental conditions of each particular country.[24]

As several chapters in this volume show, the link between environment and government was frequently somatic, that is, operated by (culturally-charged) understandings of the body—both individual bodies and the collective body of the nation (the 'body politic').[25] If the environment was what people sought to influence or overcome, and people were what they sought influence over, then, as Rebecca Earle shows in her chapter, it was the body that they understood these influences to be working through. The significance of the relationship between the body, its environment, and order extended to the domestic realm. Sandra Cavallo and Tessa Storey have shown how ensuring 'good' airs in the domestic environment was a form of 'corporeal management' designed to promote good health.[26] Similar remarks have been made for urban spaces, increasingly subject in the early modern period to air and water pollution that contemporary residents often perceived as a danger for their physical and spiritual wellbeing.[27] In rural areas, the constitution of soils was linked to the character of local populations: soils were widely believed to be composed in the same way as human bodies, that is from combinations of four fundamental qualities, hot and dry or cold and moist, and to become 'out of heart' should these qualities become imbalanced.[28] Correspondingly, the drainage of the English fenland was claimed, by one anonymous poet, to have remarkable physical and moral effects on the humoural complexion of the fenlanders:

> When with the change of Elements, suddenly
> There shall a change of Men and Manners be;
> Hearts, thick and tough as Hydes, shall feel Remorse,
> And Souls of Sedge shall understand Discourse,
> New hands shall learn to Work, forget to Steal,
> New leggs shall go to Church, new knees shall kneel.[29]

In the sixteenth and seventeenth centuries, 'climate theory' preoccupied, among others, physicians, natural philosophers, geographers and cosmographers, religious missionaries, diplomats, and political theorists. From the latter half of the seventeenth century onwards, the wealth of knowledge collected through centuries of reflection on this matter was carefully vetted, classified, and digested in light of rising scientific epistemologies, ultimately coming to inform actual practices and policies on an unprecedented scale. In an age of growing concern of nation states with the strength and prosperity of their populations, 'climate theory' indeed provided a long-standing, authoritative body of conceptual tools to think about national improvement, in both quantitative (e.g., demographic growth, increased productivity) and qualitative terms (e.g., physical health, military prowess, moral and civil conduct, intellectual skills).[30] It is therefore hardly surprising that European thinkers and policy-makers would grow increasingly interested in exploring the dynamics of environmental influence and in developing strategies for coping with it. Diet, geographical mobility, and environmental engineering were among the most common 'ways of coping' with environmental influence theorised and practised throughout the

early modern centuries, with environmental engineering rising to an ever-greater importance as we move through the period.[31] Several chapters in this volume reconstruct this history through case studies of early modern France, England, and the Americas from the early sixteenth to the early nineteenth century, thus shedding light on the considerable changes that occurred over this time span (see Earle, Spavin, Morera, Carlson). By the end of the period under consideration, we find traces of a remarkable paradigm shift in Jean-Baptiste Moheau's *Recherches et considérations sur la population de France* (Paris 1778), where environmental influence is turned from a threatening, unmasterable force into a manageable tool of bio-political governance:

> It is up to the government to change the air temperature and to improve the climate; a direction given to stagnant water, forests planted or burnt down, mountains destroyed by time or by the continual cultivation of their surface, create a new soil and a new climate. […] If the unknown principle that forms the character and the mind is the outcome of the climate, the regime, the customs, and the habit of certain actions, we can say that sovereigns […] govern the physical and moral existence of their subjects. Perhaps one day we will be able to call on these means to give whatever hue we wish to morality and the national spirit.[32]

Moheau's words point to an important development in the historical understanding of climate. Classic theories of environmental influence had posited a link between national character and environmental conditions, naturally prompting the idea that by controlling not only space but place—namely, the physical landscape of a country and its peculiar set of environmental influences—one could also control those who inhabited it. The idea that humans could, to some extent, negotiate environmental influence by modifying their living milieus was an ancient one, which nourished a substantive literature on domestic economy, architecture, farming, and landscaping. The scale and significance of such transformations, however, was usually considered to be rather small. Very few believed that human agency could go so far as to permanently change the climate of a whole region. The situation changed dramatically in the early modern period, when the traditional view of climate as fixed and unalterable came to be replaced by one of climate as the shifting outcome of land-use patterns and other forms of human environmental agency. This conceptual revolution happened gradually and was not without complexity or resistance; yet although it would be mistaken to read too much continuity into the long genealogy of modern notions of anthropogenic climate change (studied by Zilberstein in this collection), it is indeed in this direction that early modern theories appear to have been moving. [33] Both environment and climate thus became increasingly politicised notions as they were placed at the centre of new power technologies that sought to govern people indirectly by manipulating their living milieus. [34] While the emergence of 'mesopolitics'—the art of governing (through) the milieu—is often traced back to the post-Enlightenment period,[35] the essays in this volume show that the origins of this new form of political rationality are actually to be sought in sixteenth- and seventeenth-century theories of environmental influence and the governmental practices to which they gave rise.[36]

Drawing attention to the various ways in which 'climate theories' were mobilised in the early modern world in order to inspire, support, or justify such practices, the present collection sheds light on questions that have thus far remained in the margin of environmental historical studies:

in a time in which the environment was thought to shape the physical, mental, and moral makeup of human beings, how was the relationship between environment and government conceptualised and exploited in specific historical and geographical contexts? How exactly was the environment thought to 'rule' over humans, and how did humans come to claim for themselves the power to 'rule' over the environment in turn? How and when did Europeans begin to conceptualise this power in 'mesopolitical' terms, as a means of governing humans *through* their climates and living milieus?

In order to answer these questions, the chapters in this volume bring together a diverse range of sources from landmark works of 'climate theory' (such as Jean Bodin's aforementioned *République*) to local administrative records, court proceedings, and radical political texts, all of which provide a stronger grasp of the various ways in which people understood and negotiated their relationship to their environments.[37] In using these documents to access a level of early modern environmental mentalities that tends to remain peripheral to intellectual histories of environmental thought, we follow Peter Coates's remark that understandings of the natural world can be engendered as much through labour and affective relationships in and with the environment as through the 'trickle down' of Big Ideas.[38] In an age in which agriculture and manual labour were central to everyday life, 'bodily knowledge' as much as scholarly knowledge played an important role in shaping the perception and understanding of one's environment.[39] Examining how 'learned' environmental discourse differed from, but also interacted with, 'popular' understandings of the relationship between people and their environments is crucial for a fuller appreciation of early modern environmental ideas and their practical applications in various specific contexts.

This approach also sheds light on the different pace at which environmental ideas and environmental practices evolved, with practice sometimes leading developments in theory and sometimes following in their wake. The early modern period was a time of rapid intellectual change on many fronts, with critical breakthroughs in disciplines such as medicine, astronomy, and 'natural philosophy', as the natural sciences were then called.[40] However, the pace of these transformations did not always coincide exactly with the pace at which their effects began to be felt more broadly in the cultural and practical life of European societies. As the long histories of 'defeated' scientific paradigms such as astrology and humoural medicine (on which see Earle and Carlson in this volume) demonstrate, it often takes time for novel ideas to gain wide acceptance, dispel old paradigms, and filter down into actual practice.[41] Quite frequently, intellectual change comes not in the form of conceptual revolutions but in that of traditional theories that are adapted and transformed as they are used (and misused, and abused) in real-life contexts. 'Learned' and 'popular' environmental discourses should therefore be studied together if we intend to clarify not only the ways in which environmental theory and environmental practice interacted in the early modern period, but also how environmental theories themselves evolved.

The transition from theory to actual policy often involved the identification of certain aspects of particular environments as problematic. The increased identification of environmental 'problems' is indicative of the new governmental approach to the environment in this period: in nature there are no 'problems', they exist only in environments, which themselves have been environed—that is, physically and culturally inhabited—by man.[42] Several essays in this volume

show how aspects of these environments were 'rendered thinkable in such a way as to be practicable or operable' by early modern political actors.[43] From the sixteenth century onwards, the early modern period witnessed an unprecedented degree of intervention into, and engineering of, the physical world for economic and political gain. Dramatic landscape transformation took place across much of Europe and the colonised world throughout this period, as new rivers were cut, swamps drained, land reclaimed, forests cleared, land irrigated, and commons enclosed. Some of these transformations have been studied from social, cultural, and legal perspectives, but their scientific and intellectual foundations still warrant further examination. For instance, the process of drainage and enclosure in England has generated a significant amount of scholarship that has focussed on the economic rights enjoyed and then lost by commoners, and the concomitant political and cultural foment that accompanied this transformation.[44] The most innovative studies have considered the eco-legal aspects of enclosure and have characterised the double-quickset black and white thorn hedgerows used by enclosers as a kind of 'organic barbed wire'.[45] Early modern landscapes in general were inscribed with new legal topographies that reshaped how the environment was experienced. The essays in this collection shed light on the cultural and scientific premises of these practical transformations as well as on the repercussions that the latter had on further scientific change.

Deliberate, large-scale landscape change was nothing new; many of these trends had historical precedent in both the immediate and distant past. The medieval centuries witnessed significant periods of deliberate landscape change, some of which was aimed at altering local environmental conditions. Religious houses had intervened in their environments for spiritual and territorial reasons for centuries. Attracted by the positive religious virtue attached to remoteness, early Christians sought out woods and wetlands to found their religious houses. The abbeys of Crowland and Glastonbury were founded after the drainage of large expanses of marshland undertaken as a religious exercise.[46] The inhabitants of Languedoc-Roussillon drained and subsequently irrigated wetlands in Montady to produce a landscape suitable of supporting arable farming in the thirteenth century.[47] Urban communities throughout England had proved themselves watchful managers of water, waste, and smoke since the thirteenth century and continued these regulatory endeavours into the early modern period.[48]

Despite the scale of medieval landscape management and manipulation, that which was undertaken in the early modern period differed in both significance and degree. While religious motives remained an important source of legitimisation for landscape alteration schemes,[49] the early modern period also witnessed the emergence of new forms of environmental governance for politico-economical purposes. In England and France, the subject of Raphaël Morera's chapter, state-sanctioned drainage projects were undertaken throughout the seventeenth century in an attempt to improve the economic viability, climate, and governance of wetland areas. European monarchs strengthened the organisation of water management in the sixteenth century, empowering landowners to embank and defend flood-liable land through a series of legal reforms. Responding to increased population density and the more frequent incidence of disastrous fires, urban governments introduced fire regulations and building reforms in an attempt to manage one of the most profound threats to life in early modern towns.[50] Forestry became a central concern of European states, as they sought to protect a central natural resource of the 'wooden age': as the early seventeenth-century English commentator Arthur Standish surmised, 'no wood, no kingdome'.[51] On a smaller scale, farmers began to apply new intensive

agricultural techniques that required more precise and frequent manipulation of their natural resources. Water meadows, field-scale drainage and the embankment of intertidal land from the sea became increasingly common from the early seventeenth-century. Early modern governments and landowners became increasingly interested in the function and form of a variety of different ecologies and landscape types, and saw altering them as a viable way of influencing the populations over which they governed.

These new abilities and desires to control the physical world for gain were summed up in microcosm in the garden. Gardens based on geometric plans and containing species collected from across the world appeared across early modern Europe, including in Padua, Leiden, Oxford, and Paris. These gardens, according to Carolyn Merchant, 'symbolized both an improvement of nature through labour and an improvement of the human condition.'[52] Cressy Dymock proposed a large-scale vision of the farm-as-garden in 1653, designing the layout of the 'little world' of the farm so as to keep people, plants, animals and water productive and under control.[53] With these changes, Dymock argued, England would no longer need to rely on other nations and stood to gain politically and economically from the consolidation and schematisation of its farmland.[54] Contributions to this volume analyse large-scale environmental projects such as these in England, North America, South America, and France.

Frequently, practical and economic literature formed the most explicit link between environmental theory and political practice. The ideas of the natural philosophers and their predecessors are found in more concise, practical forms in writers with more immediately instrumental practical and political aims. In England, a vast literature of 'improvement' was generated by men who sought to derive specific material and political benefits through a variety of projects.[55] In Germany, *Hausväterliteratur* considered similar methods by which estates might be more profitably disposed of through the patriarchal rule of the household, new stewardship practices, and the readoption of classical agricultural methods from writers such as Columella and Cato.[56] Proponents of these new agricultural techniques wrote about them in moralistic tones that suggested, and sometimes directly claimed, that the character of peoples and nations would be improved through these works. In his *English Improver* (1649), Walter Blith urged Parliament to encourage improvement, as 'Mens spirits will be raised to such Experimenting of the Principles of Ingenuity, as that we may see this Kingdome soone raised to her utmost fruitfulnesse and greatest glory.'[57] Blith's optimism was reflected in enabling legislation passed by governments seeking the advantages of improvement. In England, drainage acts in 1600 and 1649 referred to the 'great and inestimable benefite' arising to 'Bodies Politique [and] Corporate' from draining 'wastes' and common marshes, and later to the 'great advantage and strengthening of the Nation' that would come through drainage.[58] Such improvements were channelled through the body. In 1700, Timothy Nourse, a particularly enthusiastic improver, claimed that labouring on improvement works 'quickens Appetite, and contributes to Health and Strength of Body'.[59]

Such projects were not restricted to the so-called 'Old World'. As this collection shows, discussions spread across Europe and the wider world as to how to improve land and climate for human benefit. Encounters with entirely new contexts in colonial settings and changing local environments in Europe led to the reconsideration of long-held beliefs about the role of climate in upholding the social order, driving economies, and affecting public health. Everywhere

European colonists went they observed and directed changes in local environments. In the 'New World', colonists observed the rapid environmental changes that came with the extractive practices of colonial enterprises. Spanish colonists remarked on the changes they saw occurring in the new lands they encountered: in 1579 Diego de Esquivel noted that, since the arrival of the Spanish, the people of Chinantla had declined in numbers, reducing the ground under tillage and restricting their ability to clear jungle, leading to an increase in swamps, humidity, and ultimately ill health.[60] Colonial powers identified and attempted to solve environmental 'problems' they encountered in new lands: the Spanish undertook an enormous drainage enterprise to stop what they saw as problem flooding in colonial Mexico City, and in the Transkei region of what is now modern South Africa, changes Dutch settlers made to agricultural practices turned fire from a nutrient-cycling resource into a threat that required containing. [61] The problems colonial powers encountered were frequently solved with colonial knowledge and local expertise; in Mexico City the Spanish utilised indigenous hydraulic technology, and in Ottoman Egypt, Ottoman governors relied heavily on local expertise to manage irrigation.[62]

Whilst sixteenth and seventeenth-century colonial domination was characterised by extractive environmental activities, colonists shifted the focus of their control to a more reflexive style of environmental management in later centuries. During the eighteenth century, island colonies such as St Helena and Mauritius were subject to attempts to control the environment in response to the degradation colonial powers had inflicted throughout the later seventeenth century. On Mauritius, for example, French colonial governors sought to mitigate and reverse the impacts of the colonial slave-plantation economy through the imposition of conservationist measures aimed at regulating the cutting of wood and the flow of canals.[63] These few examples, and the papers on travel and colonialism, imperial science, and North American drainage in this volume (by Earle, Zilberstein, and Carlson, respectively), indicate that any comprehensive study of environmental governance across the early modern period requires a transnational perspective to fully understand how political engagements of the environment developed in the long term, under the influence of new ideas and new experiences.

Overview of the chapters

The chapters in this volume go beyond Europe, but they do not go beyond Europeans. Nor does *Governing the Environment* cover Africa, Asia, Eastern Europe, the Middle East or Oceania. The omission of these areas is not due to their irrelevance. Important environmental histories of governance have already been written about some of these regions: Richard Grove's seminal *Green Imperialism* brought the activities of the English and Dutch East India Companies in Asia, the Caribbean and the Pacific and Indian Oceans to the centre of historical narratives about environment and government in the extra-European world.[64] Alan Mikhail and Sam White have set the agenda for Ottoman environmental history with two important books on water and state power and climate and rebellion in the early modern Ottoman empire.[65] Wenkai He has shown how the Qing state expanded its reach into local society by utilising a discourse of 'public goods' to intervene in non-state hydraulic projects.[66] The chapters assembled here proceed in a rough chronological order to address the interventions of the English, French, Spanish, Portuguese, and North Americans, both at home and abroad.

Rebecca Earle's chapter, on climate, travel, and colonialism in the early modern world, ties together several key themes running throughout the volume. Looking primarily at Spanish American colonists, Earle asks, how did colonists understand and attempt to mitigate the effects of living in foreign and often unfamiliar environments? Earle finds that Spanish colonists interpreted the novelty of New World environments through classical humoural theory. Early modern travel writers warned potential voyagers of the dangers that new environments posed to the humoural balance of their bodies. As Earle's chapter shows, the body, as the medium through which environments worked on people, was a central concern in early modern environmental thought. Unfamiliar environments could have serious and debilitating impacts on both physical health and emotional state through the body's ill-suitedness to local climates, soils, and foods. Earle shows how temperament was affected by environments, and ultimately, how the fate of the Spanish colonial endeavour rested in some way on large-scale attempts to cope with new environments. More often than not this coping involved significant amounts of environmental change. Colonists imported basic old-world commodities like red wine, olive oil, and wheat in order to help their bodies cope with the upheaval. But they also began to make changes to the landscapes they inhabited, growing wheat, olives, and grapes. Thus quotidian aspects of European life became building blocks for Spanish life in the Americas. American environments needed to be able to reproduce European agriculture and European commodities in order to sustain a successful colony.

Richard Spavin's chapter addresses this relationship between governing regimes and their environments through a re-reading of Jean Bodin's *Six Books of Commonwealth*. In spite of Lucien Febvre's protestations in his *Geographical Introduction to History*, Bodin has been characterised as one of the clearest exponents of a crude kind of environmental determinism.[67] He has been enlisted, along with Montesquieu, as one of two proscriptive, deterministic, and classically-influenced bookends for early modern environmental thought.[68] In Bodin, Spavin identifies the concept of 'ana*chor*ism'—of deliberate geographical inaccuracy—to reinterpret this legacy. Reading Bodin within the context of the religious and political turmoils of sixteenth-century France, Spavin excavates several formulations of 'climate theory' from across Bodin's writings. By analysing the inconsistencies between Bodin's various formulations of the relationship between climate, geography, and human society, Spavin questions Bodin's legacy as an environmental determinist, and even as a climate theorist. Instead, Spavin argues, Bodin ought to be seen as creatively engaging a corpus of classical ideas at specific moments across the sixteenth century in constant intertextual dialogue with his own work and that of other writers. These intellectual and literary contexts enable us to see Bodin's use of 'climate theory' as less an endorsement of classical ideas and more a comment on contemporary France. By replacing Aristotelian 'hellenocentrism'—the belief that Greece had the optimum climate for an advanced civilisation—with his own 'gallocentrism', Bodin could explore the 'geographical errors' of French political and religious turmoil.

Raphaël Morera examines how Bodin's writings related to practical political projects in the seventeenth century. In his chapter on marshes as 'micro-climates', Morera traces how humoural and climatic theories found in Bodin other Renaissance authors were deployed in a number of drainage schemes on French marshlands. Morera shows how the French monarchy became increasingly interested in environmental regulation during the early modern period. Edicts and new legislation enabled the better administration and closer oversight of rivers, marshes, and

forests. Marshes and wetlands in particular were seen as underexploited regions. Their supposedly bad airs and unenclosable, uncultivable landscapes were portrayed as wastelands, and the people that inhabited them obstinately backward, economically unproductive, and politically ungovernable. As Morera shows, the monarchical impetus for drainage was then both economic and political: to drain was to gain productive land from unproductive waste, 'improve' the resident population, and extend the reach of government. Morera shows how local environmental conditions were dramatically changed at the behest of an expanding state, and in response to classically-inflected 'climate theories'. In seventeenth-century France, marshes were symbolically significant—uncultivated, unimproved land was a sign of a lack of civilisation and political order. Drainage, in the monarchical ideology described by Morera, served to integrate marginal areas within the broader polity by erasing climatic aberrations, and reconciling them with the 'true' French environment.

In her paper on north-east England's River Tyne, Leona Skelton also analyses the ideas and goals that lay beneath practical environmental management. Bringing new sources, and new voices, into the conversation about early modern environments, Skelton demonstrates how records from the archives of social history can be applied to further our understanding of early modern environmental management. Skelton uses the minutes of the Tyne River Court—which was appointed to regulate the Tyne estuary in 1613 by the river's official conservators, Newcastle Corporation—to reveal a long history of conservation and management of the River Tyne. Records of local administration remain under-exploited by early modern environmental historians. Medievalists have made good use of court records to reveal environmental histories of disease and urban farming, and in climatic reconstruction.[69] Yet most early modern historians have viewed courts and administrative bodies as social institutions pursuing social ends.[70] As Skelton demonstrates, they contain significant evidence of environmental attitudes, policies, and objectives. Looking at the regulations enforced on the Tyne between the mid-sixteenth and the nineteenth century, Skelton carefully reconstructs the changing ways in which administrators in Newcastle viewed and interacted with their naturally powerful river, on which they relied so heavily for their income. Skelton shows that through frequent, regular, and practical engagements with the Tyne, its conservators developed complex and empirically-grounded methods for controlling the impacts of external environmental phenomena and thus protecting the river, the economic heart of a city and a region.

In like manner to Skelton, Ashley Dodsworth takes up sources well-used by social and political historians—the writings of seventeenth-century English radical Gerard Winstanley—and asks how we might understand them as environmental in her chapter on the importance of land and labour to Winstanley's politics. As Donald Worster has shown, environmental history can be 'done' in any number of places, from the field to the factory, it just takes critical effort from us as historians to recognise the environmental.[71] Likewise, we can excavate the environmental from the sources we are most comfortable with as early modernists. In her contribution, Dodsworth provides an environmental re-reading of Winstanley's political writings. Focussing on the importance Winstanley attached to labour, Dodsworth shows that ownership of, access to, and cultivation of the land was integral to Winstanley's radical vision for England in the 1640s and 1650s. For Dodsworth, the key to Winstanley's thought is his understanding of governance as an embodied phenomenon: that it is acted and experienced through affective relationships with the physical environment. Labouring on land that was held privately, in an environment that

was ‘locked up’, contributed to the subjugation of the English peasantry. For Winstanley, liberation would be achieved through a radical opening of natural resources, in which labour on free land was the only way to ensure a free and just society. By paying attention to the importance of labour and the transformation of ‘waste’ land, Dodsworth reveals the environmental – but by no means ‘green’ – aspects of Winstanley’s thought.

William Cavert addresses another aspect of the relationship between environmental and political order in the early modern period. Analysing a number of responses to harsh winters and extreme cold in early modern England, Cavert reassesses the long-held historiographical assumption that in the ‘enchanted’, Divinely-malleable, and providential world of seventeenth-century England, changes in the weather were understood as judgements on the rulers of the day. Focussing on responses to the unusually cold winters of 1607/8 and 1684, Cavert’s chapter nuances recent discussions of weather events as Divine portents and judgements on contemporary events by revealing a diversity of responses to harsh winters. Cavert shows that instead of inducing crises, freezing conditions provided opportunities for sociability, mirth and play at ice fairs, observation and discussion among newsletter correspondents (little of which was political), and moments of state formation rather than disintegration through opportunities for charity and relief-provision. This history of politically uncontentious hard winters is important. In an era in which environmental phenomena were invested with so many political meanings and interpretations, Cavert shows we cannot take such responses for granted. It is testament to the diversity of ideas about the role of the environment in social and political life that at moments in which we might expect the environment to play a starring role in explanations of politics, it is conspicuously absent. To invoke the relationship between environment and society was to make claims about the world that were frequently political in nature. The lack of politics attached to events we might see as prime for political interpretation de-couples early modern environmental thought from early modern political thought. Cavert’s analysis helps us see that environmental influence was not taken as a given; those who invoked it were not necessarily parroting long-established commonplaces, they were doing intellectual work.

Anya Zilberstein looks at another instance of political readings of environmental phenomena in her chapter on the transmission of knowledge about glacial retreat in the scientific networks of Sir Joseph Banks. Banks, the most influential scientific patron in the English-speaking world, directed much of the scientific investments made across Britain’s empire. From his position as head of the Royal Society, in the heart of the metropole, Banks corresponded with a wealth of scientific observers offering description and analysis of phenomena from across the world. In his various positions at the heart of the British state—the Colonial and Home Offices, the Admiralty, and the Board of Agriculture—Banks retained quite different interests. Zilberstein demonstrates how Banks’ multiple public roles coalesced in his sponsorship of expeditions to the Arctic in search of a northwest passage. Responding to news about climatic change and a potentially thawing north-western shipping route, Banks jumped on unreliable and unverified scientific observations to justify a project that would be of great importance to the empire were a passage to be found. Zilberstein shows us not only an early example of the politicisation of climate science, but a clear example of the political nature of practices of environing. Banks’ enthusiasm for the discovery of a northwest passage shows us the extent to which the climate had become an object of both scientific analysis and state interests by the early nineteenth century. Drawing on a long history of speculation about the nature of climate, and driven by social, economic, and

political rationale, Banks was prepared to imagine and invest in an Arctic that piqued both his scientific and political interests.

Anthony Carlson's chapter, along with Earle's and Dodsworth's, highlights the importance of the body in understandings of environmental influence and attempts to manipulate it for gain. Carlson demonstrates the continued importance of climatic, miasmic, and humoural theory in the United States in the later eighteenth and nineteenth centuries, showing how the spread of Yellow Fever in the 1790s brought these much older, European ideas to the fore in medical and agricultural discussions of public health, federal, and state land use policy. Discoveries in medicine, meteorology, and pneumatic chemistry pointed to water – particularly standing and stagnant water – as the source of miasmas, the cause of yellow fever, and thus the determinant factor in the creation of unhealthy climates. Tracing the influential discourses of humouralism and miasma through European writings on agricultural science, through local American agricultural magazines, and eventually into the official record of the US Congress, Carlson shows that Americans continued to grapple with, succumb to, and attempt to influence, their climates and environments, well into the nineteenth century. They did this through a series of landscape interventions by public drainage authorities, displaying a strong faith in public institutions' capability to intervene in local environments on public health grounds. For late-eighteenth and nineteenth-century Americans, disease linked people, environmental conditions, and place. Carlson's chapter demonstrates the enduring importance of notions of environmental influence and refutes the idea that, by the early-nineteenth century, Americans had dismissed the influence of their surroundings and mentally conquered their climate.

With Carlson's essay we reach the threshold of the industrial age, a period in which the multiple interconnections of science, environmental governance, political ideology, and social engineering examined in this volume did not disappear but rather were strengthened and refined.[72] It remains to be seen to what extent these later developments stand in continuity with the earlier phenomena studied in this volume, or whether changes in medical and scientific thought (including the decisive shift from a humoural and flexible to a biological and fixed view of the human body),[73] technological advances, and social and political transformations in the 'age of the masses' brought about significant changes in the theory and practice of 'mesopolitics'. But this is food for further thought. Our main ambition here has been to identify and test new avenues for research that may fruitfully be pursued by early modern scholars as well as by scholars in other periods. Some of these avenues are helpfully sketched out in Franz Mauelshagen's afterword, which closes the volume while opening it up to a hopefully rich series of follow-up studies.

Collectively, this collection raises more questions than we may have been able to answer; occasional dissonances may be spotted, arising from the different contexts examined, sources used, and methodologies employed; but all of this is testament, we believe, to the diversity of approaches that could and should go on to contribute to a long-term history of environmental theories and practices. As the following chapters show, the early modern period is an especially important, though lesser-known, chapter in the genealogy of Western debates over climate, climate change, and environmental governmentality. Strategically nested between the Renaissance and its recovery of classical knowledge on the one hand, and the industrial age with its fast-paced social, political, and environmental transformations on the other, the early modern

period occupies a central place in this centuries-long history, and one that, as we hope to have shown, deserves further attention for its creative blending of old and new modes of understanding and engaging with climate and environmental problems. Our hope is that the present collection will pave the way to further interdisciplinary study of the long and complex history of environmental governance and of its political uses—a topic that we can only expect to become ever more central to the concerns of our own age.

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[1] Bruce M. S. Campbell, 'Nature as Historical Protagonist: Environment and Society in Pre-Industrial England', *The Economic History Review* 63, no. 2 (2010); Greg Bankoff, 'Winds of Colonisation: The Meteorological Contours of Spain's Imperium in the Pacific 1521–1898', *Environment and History* 12, no. 1 (2006); Geoffrey Parker, *Global Crisis: War, Climate Change and Catastrophe in the Seventeenth Century* (New Haven: Yale University Press, 2013); Sam White, *The Climate of Rebellion in the Early Modern Ottoman Empire* (Cambridge: Cambridge University Press, 2013).

[2] For the importance of an environmental history oriented towards the retrieval of the historical agents' meanings and intentions, see Christian Pfister, 'Weather, Climate, and the Environment', in *The Oxford Handbook of Early Modern European History, 1350–1750, vol. 1: Peoples and Place*, ed. Hamish Scott (Oxford: Oxford University Press, 2015), 70. A similar approach has been attempted for the Enlightenment and post-Enlightenment periods by, for instance, Jan Golinski, *British Weather and the Climate of Enlightenment* (Chicago and London: University of Chicago Press, 2007) and *Klima*, ed. James R. Fleming and Vladimir Jankovic special issue of *Osiris* 26, no. 1 (2011).

[3] William Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York: Hill & Wang, 1983); Richard Grove, *Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600–1860* (Cambridge: Cambridge University Press, 2003).

[4] For a genealogy of the notion of 'sustainability', see Paul Warde, 'The Invention of Sustainability', *Modern Intellectual History* 8, no. 1 (2011): 153–170. Although the word 'ecology' is not attested until 1866, when it was first introduced by the German biologist Ernst Haeckel (1834–1919), Donald Worster has argued that ecological ideas *avant la lettre* can already be located in the eighteenth century (*Nature's Economy: A History of Ecological Ideas* [Cambridge: Cambridge University Press, 1994]).

[5] Paul Warde, 'Imposition, Emulation and Adaptation: Regulatory Regimes in the Commons of Early Modern Germany', *Environment and History* 19, no. 3 (2013).

[6] Paul Sabin, 'Rooting around in Search of Causality', *Environmental History* 10, no. 1 (2005): 83.

[7] Gary Wickham and Jo-Ann Goodie, *Legal and Political Challenges of Governing the Environment and Climate Change: Ruling Nature* (London and New York: Routledge, 2013), 42–43.

[8] OED, 'Environment', n. 1 <http://www.oed.com/view/Entry/63089> [last accessed 9 June 2016].

[9] Ptolemy, *Tetrabiblos*, 2.2.58, ed. F.E. Robbins (Cambridge MA: Harvard University Press, 1940), 127.

[10] Ptolemy, *Tetrabiblos*, 2.1, 117. On ancient and early modern meteorology, see Craig Martin, *Renaissance Meteorology: From Pomponazzi to Descartes* (Baltimore: Johns Hopkins University Press, 2011). For an ancient application of elemental meteorology to medical thought, see the collection of pseudo-Aristotelian *Problems* in *The Complete Works of Aristotle: The Revised Oxford Translation*, ed. Jonathan Barnes (2 vols; Princeton: Princeton University Press, 1984), 14.7.41–42, ii, 1414.
[11] Ptolemy, *Tetrabiblos*, 2.2, 127.
[12] Marian J. Tooley, 'Bodin and the Mediaeval Theory of Climate', *Speculum* 28, no. 1 (1953).
[13] For ancient theories of *klima*, see Alexander Altmann, 'Judah Halevi's Theory of Climates', *Aleph* 5 (2005). For their medieval and early modern reception, see N. Wey Gómez, *The Tropics of Empire: Why Columbus Sailed South to the Indies* (Cambridge, MA: The MIT Press, 2008).
[14] Clarence Glacken, *Traces on the Rhodian Shore. Nature and culture in western thought from ancient times to the end of the eighteenth century* (Berkeley, CA: University of California Press, 1967), 80–115; Andrew Wear, 'Place, Health, and Disease: The Airs, Waters, Places Tradition in Early Modern England and North America', *Journal of Medieval and Early Modern Studies* 38, no. 3 (2008). See the second section, below, for further details on ancient and early modern theories of climate.
[15] Philip W. Sutton, *The Environment: A Sociological Introduction* (Cambridge: Polity Press, 2007), 1–4.
[16] Sverker Sörlin and Paul Warde, 'Making the Environment Historical – An Introduction', in *Nature's End: History and the Environment*, ed. Sverker Sörlin and Paul Warde (Basingstoke: Palgrave, 2009), 2–3; Paul Warde, 'The Environmental History of Pre-industrial Agriculture in Europe', in *Nature's End*, ed. Sörlin and Warde, 75; Sverker Sörlin, 'Reconfiguring Environmental Expertise', *Environmental Science & Policy* 28 (2013): 16; Dolly Jørgensen and Sverker Sörlin, 'Making the Action Visible: Making Environments in Northern Landscapes', in *Northscapes: History, Technology, and the Making of Northern Environments*, ed. Dolly Jørgensen and Sverker Sörlin (Vancouver: UBC Press, 2013), 5.
[17] Hannes Bergthaller, et al., 'Mapping Common Ground: Ecocriticism, Environmental History, and the Environmental Humanities', *Environmental Humanities* 5 (2014): 267. On 'place-making', see John Dixon Hunt, *Greater Perfections: The Practice of Garden Theory* (London: Thames and Hudson, 2000).
[18] Sörlin, 'Reconfiguring Environmental Expertise', 16.
[19] Vladimir Jankovic, *Confronting the Climate: British airs and the making of environmental medicine* (New York: Palgrave Macmillan, 2010), 4; Mary Floyd-Wilson, *English Ethnicity and Race in Early Modern Drama* (Cambridge: Cambridge University Press, 2003), 29.
[20] Frank Lestringant, 'Europe et théorie des climats dans la seconde moitié du XVIe siècle', in *La conscience européenne au XVe et au XVIe siècle. Actes du colloque international organisé à l'Ecole Normale Supérieure des Jeunes Filles (30 sept.-3 oct. 1980)* (Paris: Ecole Normale Supérieure des Jeunes Filles: 1986), 206–226; Mario Pinna, 'Un Aperçu historique de la "théorie des climats"', *Annales de géographie* 547 (1989): 322–25; Reimar Müller, 'Montesquieu über Umwelt und Gesellschaft – die Klimatheorie und ihre Folgen', *Sitzungsberichte der Leibniz-Sozietät* 80 (2005): 19–32.
[21] For a reappraisal of the conceptual history of climate, see Franz Mauelshagen, 'Ein neues Klima im 18. Jahrhundert', *Zeitschrift für Kulturwissenschaften* 1 (2016): 39–57.

[22] See Glacken, *Traces on the Rhodian Shore*; Lucien Boia, *The Weather in the Imagination*, trans. Roger Leverdier (London: Reaktion Books 2005); Sara Miglietti, 'Mastering the Climate: Theories of Environmental Influence in the Long Seventeenth Century' (PhD dissertation, University of Warwick, 2016).
[23] Montesquieu may at once be seen as the apogee of an older tradition and as the initiator of a new one. On his transitional role, see Mauelshagen, 'Ein neues Klima im 18. Jahrhundert'. On Montesquieu as a 'climate theorist', see, in this volume, Morera, 'Marshes as Microclimates' and Spavin, 'Jean Bodin and the Idea of Anachorism'.
[24] Jean Bodin, *Les Six livres de la République* (Paris: Jacques Du Puys, 1576), 516 (5.1: 'Du reiglement qu'il faut tenir pour accommoder la forme de République à la diversité des hommes').
[25] For this link between individual bodies and the body politic, and how it operates in early modern 'biopolitics', see David Glimp, *Increase and Multiply: Governing Cultural Reproduction in Early Modern England* (Minneapolis: University of Minnesota Press, 2003).
[26] Sandra Cavallo and Tessa Storey, *Healthy Living in Late Renaissance Italy* (Oxford: Oxford University Press, 2013), 8; Sandra Cavallo, 'Health, Air and Material Culture in the Early Modern Italian Domestic Environment', *Social History of Medicine* (forthcoming), 11.
[27] Mark Jenner, 'The Politics of London Air: John Evelyn's *Fumifugium* and the Restoration', *Historical Journal* 38, no. 3 (1995); *Curare la città: sanità e igiene a Firenze, Roma, Parigi, Londra, Barcellona*, ed. Renato Sansa, special issue of *Storia Urbana* 112 (2006); Ken Hiltner, *What Else is Pastoral? Renaissance Literature and the Environment* (Ithaca and London: Cornell University Press, 2011), Chapter 5; William M. Cavert, *The Smoke of London: Energy and Environment in the Early Modern City* (Cambridge: Cambridge University Press, 2016).
[28] Verena Winiwarter, 'The Art of Making the Earth Fruitful: Medieval and Early Modern Improvements in Soil Fertility', in *Ecologies and Economies in Medieval and Early Modern Europe*, ed. Scott G. Bruce (Leiden: Brill, 2010), 99; Warde, 'The Invention of Sustainability', 156.
[29] Jonas Moore, *The history or narrative of the great level of the fenns, called Bedford level with a large map of the said level, as drained, surveyed, & described by Sir Jonas Moore Knight, His late Majesties Surveyor-General of his ordnance* (London: Moses Pitt, 1685), 75–76. On the dispute surrounding these drainage schemes and the competing ideological arguments mobilised therein, see Hiltner, *What Else is Pastoral?*, Chapter 6.
[30] See Glacken, *Traces on the Rhodian Shore* (especially Chapters 1.2, 2.2, 3.2); Lestringant, 'Europe et théorie des climats dans la seconde moitié du XVIe siècle', 218–21; Floyd-Wilson, *English Ethnicity*; Glimp, *Increase and Multiply*; Boia, *The Weather in the Imagination*, 23.
[31] See Miglietti, 'Mastering the Climate'.
[32] 'Ces moyens de diriger et de changer le cours de la population sont dans la main du gouvernement; sa puissance est plus étendue encore; souvent il dépend de lui de changer la température de l'air et d'améliorer le climat. Un cours donné aux eaux croupissantes, des forêts plantées ou brulées, des montagnes détruites par le temps ou par la culture continuelle de leur superficie, forment un sol et un climat nouveau. Si du climat, du régime, des usages, de l'habitude de certaines actions, il résulte le principe inconnu qui forme les caractères et les esprits, on peut dire que les Souverains […] régissent l'existence physique et morale de leurs sujets. Peut-être un jour pourra-t-on tirer parti de ces moyens pour donner aux moeurs et à l'esprit de la nation une nuance à volonté' (Jean-Baptiste Moheau, *Recherches et considérations sur la population de France* [Paris, 1778], 291–92; quoted and translated in Michel Foucault,

Security, Territory, Population: Lectures at the Collège de France 1977–1978, trans. Graham Burchell (Basingstoke: Palgrave Macmillan, 2007: 22–23). For a discussion of this text, see Miglietti, 'Mastering the Climate', 278–281, 288–289.

[33] James Fleming, *Historical Perspectives on Climate Change* (Oxford and New York: Oxford University Press, 1998).

[34] Michel Foucault, *Naissance de la biopolitique: Cours au Collège de France (1978–1979)* (Paris: Gallimard, 2004). For useful introductions to governmentality, see Margo Huxley 'Geographies of Governmentality', in *Space, Knowledge, Power: Foucault and Geography*, ed. J. Crampton and S. Elden (London, Ashgate, 2007), 185–204; Peter Miller and Nikolas Rose, *Governing the Present: Administering Economic, Social and Personal Life* (London: Polity, 2008).

[35] On mesopolitics ('mésopolitique') see Ferhat Taylan, 'La Rationalité mésologique. Connaissance et gouvernement des milieux de vie (1750–1900)' (PhD Thesis, Université de Bordeaux III, 2014).

[36] According to Mark Harrison (*Climates and Constitutions: Health, Race, Environment and British Imperialism in India, 1600–1850* [Oxford: Oxford University Press, 1999]) and Jean-Baptiste Fressoz (*L'Apocalypse joyeuse. Une histoire du risque technologique* [Paris: Seuil, 2012]), among others, it was only after 1800 that attitudes towards environmental influence shifted from being predominantly adaptive or reactive towards being increasingly proactive, as the idea that 'favourable climates could be manufactured' came to be largely accepted (Harrison, *Climates and Constitutions*, 22). However, recent research shows that a clear trend in this sense can already be detected in the seventeenth century (see Miglietti, 'Mastering the Climate', Chapter 4, and Morera, 'Marshes as Microclimates' in this volume).

[37] Gerhard Jaritz and Verena Winiwarter, 'On the Perception of Nature in Renaissance Society', in *Nature and Society in Historical Context*, ed. Mikuláš Teich, Roy Porter and Bo Gustafsson (Cambridge: Cambridge University Press, 1997), 91–111.

[38] Peter Coates, *Nature: Western Attitudes Since Ancient Times* (Cambridge: Polity, 1998), 81.

[39] For bodily knowledge, see, Richard White, '"Are You an Environmentalist or Do You Work for a Living?": Work and Nature', in *Uncommon Ground: Towards Reinventing Nature*, ed. William Cronon (New York: W.W. Norton, 1995), 173.

[40] See, e.g., *Reappraisals of the Scientific Revolution*, ed. David C. Lindberg and Robert S. Westman (Cambridge: Cambridge University Press, 1990); Andrew Wear, *Knowledge and Practice in English Medicine, 1550–1680* (Cambridge: Cambridge University Press, 2000); Craig Martin, *Renaissance Meteorology from Pomponazzi to Descartes* (Baltimore, MD: Johns Hopkins University Press, 2011), all of which document the significant transformations taking place in various fields of science and medicine in the seventeenth century without subscribing acritically to conventional notions of a 'scientific' and 'medical' revolution, but rather emphasising both continuities and discontinuities with earlier periods.

[41] On the 'long decline' of astrology and humouralism, see respectively: Bernard Capp, *Astrology and the Popular Press*: *English Almanacs, 1500–1800* (London: Faber and Faber, 1979) and Harrison, *Climates and Constitutions*.

[42] Sörlin, 'Reconfiguring Environmental Expertise', 16.

[43] Miller and Rose, *Governing the Present*, 15–16.

[44] Keith Lindley, *Fenland Riots and the English Revolution* (London: Heinmann, 1982); Clive Holmes, 'Drainers and Fenmen: The Problem of Popular Political Consciousness in the

Seventeenth Century', in *Order and Disorder in Early Modern England*, ed. Anthony Fletcher and John Stevenson (Cambridge: Cambridge University Press, 1985), 166–95; H.C. Darby, *The Changing Fenland* (Cambridge: Cambridge University Press, 1983).
[45] Nicholas Blomley, 'Making Private Property: Enclosure, Common Right and the Work of Hedges', *Rural History* 18, no. 1 (2007).
[46] Ellen F. Arnold, *Negotiating the Landscape: Environment and Monastic Identity in the Medieval Ardennes* (Philadelphia: University of Pennsylvania Press, 2012); Stephen Rippon, '"Uncommonly rich and fertile" or "not very salubrious"? The Perception and Value of Wetland Landscapes', *Landscapes* 1 (2009): 50; Vittoria Di Palma, *Wasteland: A History* (New Haven, CT: Yale University Press, 2014), 89–92.
[47] Richard Hoffmann, *An Environmental History of Medieval Europe* (Cambridge: Cambridge University Press, 2013), 138.
[48] Carole Rawcliffe, *Urban Bodies: Communal Health in Late Medieval English Towns and Cities* (Woodbridge: The Boydell Press, 2013); Leona Skelton, *Sanitation in Urban Britain, 1560–1700* (London: Routledge, 2016).
[49] Keith Thomas, *Man and the Natural World: Changing Attitudes in England, 1500–1800* (London: Penguin, 1983), 254–55.
[50] David Garrioch, '1666 and London's Fire History: A Re-Evaluation', *The Historical Journal* 59, no. 2 (2016).
[51] Paul Warde, 'Fear of Wood Shortage and the Reality of the Woodland in Europe, c. 1450–1850', *History Workshop Journal* 62 (2006). Standish cited in Warde, 'The Invention of Sustainability', 160.
[52] Carolyn Merchant, *Reinventing Eden: The Fate of Nature in Western Culture* (New York: Routledge, 2003), 59–63.
[53] Cressy Dymock, 'A DISCOVERY For New DIVISIONS, OR, Setting out of LANDS, as to the best Forme: Imparted in a Letter to Samuel Hartlib, Esquire', in *A discoverie for division or setting out of land, as to the best form published by Samuel Hartlib esquire, for direction and more advantage and profit of the adventurers and planters in the fens and other waste and undisposed places in England and Ireland,* ed. Samuel Hartlib (London: Richard Wodenothe, 1653), 1–11.
[54] Richard Grove, 'Cressey Dymock and the Draining of the Fens: An Early Agricultural Model', *The Geographical Journal* 147, no. 1 (1981).
[55] Paul Slack, *The Invention of Improvement: Information and Material Progress in Seventeenth-Century England* (Oxford: Oxford University Press, 2014).
[56] Torsten Meyer, 'Cultivating the Landscape: The Perception and Description of Work in Sixteenth- to Eighteenth-Century German "Household Literature" (*Hausväterliteratur*)', in *The Idea of Work in Europe from Antiquity to Modern Times,* ed. Josef Ehmer and Catharina Lis (Farnham: Ashgate, 2009), 222.
[57] Walter Blith, *The English improver, or a new survey of husbandry* (London: J. Wright, 1649), Sig. A1v.
[58] 43 Elizabeth I, c. 11 'An Act for the Recovery of Many Hundred Thousand Acres of Marshes and other Groundes', in *Statutes of the Realm* (11 vols; London: HMSO, 1810), iv, 977; 'May 1649: An Act for drayning the Great Level of the Fens, extending itself into the Counties of Northampton, Norfolk, Suffolk, Lincoln, Cambridge and Huntingdon, and the Isle of Ely, or

some of them.' in *Acts and Ordinances of the Interregnum, 1642–1660*, ed. C.H. Firth and R.S. Rait (London: HMSO, 1911), 130–139.
[59] Timothy Nourse, *Campania Foelix, Or, A Discourse of the Benefits and Improvements of Husbandry Containing Directions for All Manner of Tillage, Pasturage, and Plantation* (London: Thomas Bennet, 1700), 4.
[60] Glacken, *Traces on the Rhodian Shore*, 359.
[61] Vera Candiani, *Dreaming of Dry Land: Environmental Transformation in Colonial Mexico City* (Stanford: Stanford University Press, 2014); Simon Pooley, *Burning Table Mountain: An Environmental History of Fire on the Cape Peninsula* (Basingstoke: Palgrave Macmillan, 2014), 16–28.
[62] Candiani, *Dreaming of Dry Land*, 31; Alan Mikhail, *Nature and Empire in Ottoman Egypt: An Environmental History* (Cambridge: Cambridge University Press, 2013), 39.
[63] Grove, *Green Imperialism*.
[64] Grove, *Green Imperialism*.
[65] Mikhail, *Nature and Empire in Ottoman Egypt*; White, *The Climate of Rebellion*.
[66] Wenkai He, 'Public Interest and the Financing of Local Water Control in Qing China, 1750–1850', *Social Science History* 39, no. 3 (2015).
[67] Lucien Febvre with Lionel Bataillon, *A Geographical Introduction to History* (London: Kegan Paul, Trench Trubner & Co, 1925), 1–17.
[68] Glacken, *Traces on the Rhodian Shore*, 565–566.
[69] Philip Slavin, 'The Great Bovine Pestilence and Its Economic and Environmental Consequences in England and Wales, 1318–50', *Economic History Review* 65, no. 4 (2012); Dolly Jørgensen, 'Running Amuck? Urban Swine Management in Late Medieval England', *Agricultural History* 87, no. 4 (2013); Alan R. Macdonald and John McCallum, 'The Evidence for Early Seventeenth-Century Climate from Scottish Ecclesiastical Records', *Environment and History* 19, no. 4 (2013).
[70] Exceptions include Angus Winchester, *The Harvest of the Hills: Rural Life in Northern England and the Scottish Borders, 1400–1700* (Edinburgh; Edinburgh University Press, 2000).
[71] Donald Worster, 'Doing Environmental History', in *The Ends of the Earth: Perspectives on Modern Environmental History*, ed. Donald Worster (Cambridge: Cambridge University Press, 1988), 289–307.
[72] See, e.g., Eric T. Jennings, *Curing the Colonizers: Hydrotherapy, Climatology, and French Colonial Spas* (Purdue: Duke University Press, 2006); Janković, *Confronting the Climate*; Jean-Baptiste Fressoz, *L'apocalypse joyeuse. Une histoire du risque technologique* (Paris: Seuil, 2012).
[73] On shifting attitudes towards the human body, see Harrison, *Climates and Constitutions*.